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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,871	08/03/2001	Arie Cornelis Besemer	B041745JGD/S	5309

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EXAMINER
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MAIER, LEIGH C

ART UNIT	PAPER NUMBER
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1623

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/830,871

Applicant(s)

BESEMER ET AL.

Examiner

Leigh C. Maier

Art Unit

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 March 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-36 is/are pending in the application.
- 4a) Of the above claim(s) 22-29 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 is/are allowed.
- 6) ☒ Claim(s) 16-20 and 30-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/25/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Status of the Claims***

Claims 16, 18, 21, 32, and 33 have been amended. Claims 34-36 are newly added. Claims 16-36 are pending. Claims 22-29 have been withdrawn as being drawn to a non-elected invention. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 102***

Claims 16-19 and 30-33 are again rejected under 35 U.S.C. 102(b) as being anticipated by LEROY et al (US 3,553,193), as set forth in previous Office actions. Newly added claims 34-36 are included in this rejection.

Claims 16, 18, 32, and 33 have been amended so that the 1,2-dihydroxyethylene groups are required to be part of a 5- or 6-membered ring. The claims are further amended to more specifically describe the method of preparation. The examiner would reiterate that the determination of patentability of a product is based on the final product itself and is not dependent upon its method of preparation. LEROY teaches the oxidation of starch as discussed previously. Amylopectin and amylose, as recited in claims 34-36 are types of starch, branched and straight-chained, respectively, with naturally occurring starches typically comprising both types.

Applicant's arguments filed March 25, 2005 have been fully considered but they are not persuasive.

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Applicant cites WHISTLER et al (JACS, 1957) to support the argument that aldehydes would not be formed in the LEROY process because according to this reference “[a]ldehydes occur nowhere in this oxidation sequence.” (Emphasis in original) The examiner notes that the proposed sequence in the reference is prefaced: “The oxidative reaction *may be envisioned* as following one of *several courses* but the two most likely are illustrated.” (Emphasis added) This does not appear to be a definitive statement that aldehydes are absolutely not produced in this reaction. Furthermore, as discussed previously, MASKASKY (US 5,607,828 – of record) teaches a mechanism (expanding on but not contradicting WHISTLER) that allows for a mixture of aldehydes and carboxyls. The examiner finds MASKASKY, published 40 years after WHISTLER, likely to be more representative of the state of the art regarding what is known about this reaction. Furthermore, CHIU et al (US 5,700,917) interprets the products produced by LEROY as a combination of aldehydes and carboxyls. See paragraph bridging col 1-2.

Applicant further discusses derivatized starches oxidized by LEROY. It appears to be Applicant’s position that the only aldehydes produced in this reference are those produced in side chains of derivatized starches because, as per WHISTLER, aldehyde production at the 3- and 4-positions would be impossible. This position is unpersuasive, as there is nothing definitive in WHISTLER, as discussed above.

Finally, Applicant cites LEROY at col 4, lines 63-66 “where it is stated that by sophisticated analysis no oxidation on the basic starch unit was found at all, and that only the (non-starch) side chain was oxidized.” The examiner agrees, but this passage is discussing the selective oxidation at side chains in starches that *have* side chains. The examples cited in previous Office actions are ones in which underivatized starches are oxidized.

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Claims 16 and 20 are again rejected under 35 U.S.C. 102(b) as being anticipated by BATTISTA et al (US 3,111,513), as set forth in previous Office actions.

The claims have been amended as set forth above.

Claim 16 has been amended as set forth above. Again, determination of patentability of a product is based on the final product itself and is not dependent upon some intermediate state attained during processing.

Applicant's arguments filed March 25, 2005 have been fully considered but they are not persuasive.

Applicant argues that the reference does not state what proportion of aldehyde groups are present. This was previously noted by the examiner, but in view of the broad ranges cited in the claims and the number of examples provided by the reference, it would appear more likely than not that the disclosed products would fall within the range. Applicant has submitted no persuasive evidence to the contrary.

Applicant maintains that "[r]egular hypochlorite oxidation of carbohydrates is *known* not to lead to intact molecules having aldehyde groups." (Emphasis added) The examiner respectfully disagrees that this is something that is *known*. Furthermore, BATTISTA does not hypochlorite exclusively as the oxidizing agent. See, for example, Example 5.

Applicant alleges that the reaction conditions described "point to extensive breakdown of the cellulose." From this, it appears to be Applicant's position that any aldehyde that may be produced are due to the ones on the increased number of terminal ends after this alleged breakdown. "There is no indication, nor is it conceivable, that the product contains any aldehyde groups at the positions of the original 1,2-dihydroxyethylene groups of the cyclic starch [sic]

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units.” First of all, Applicant presents no evidence supporting this breakdown hypothesis.

Moreover, BATTISTA states “the aldehyde derivatives ... are suitably prepared by the oxidation of the cellulose crystallites with periodic acid, an oxidizing agent which specifically opens the anhydroglucose ring at the 2,3 position and which converts the hydroxyl groups at those positions to aldehyde groups.” See col 3, lines 56-61. Also, “[a]nother preparation for the carboxy compounds is to oxidize the dialdehyde derivatives ... the resulting carboxylated material having carboxyl groups at the 2 and 3 positions of the anhydroglucose ring.” See col 5, lines 10-15. As cited previously, the examples disclose mixed aldehyde/carboxyl products. A fair reading of this reference clearly supports oxidation products anticipating these claims.

Claims 16-18, 20, and 30-33 are rejected under 35 U.S.C. 102(b) as being anticipated by JAYME et al (Ber. Deut. Chem. Ges., 1944).

JAYME discloses a monoaldehyde/monocarboxylic cellulose oxidation product. See reaction scheme at page 386.

Applicant’s submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on March 25, 2005 prompted the new ground of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609(B)(2)(i). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

*Allowable Subject Matter*

Claim 21 allowed for reasons of record.

*Examiner's hours, phone & fax numbers*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh Maier whose telephone number is (571) 272-0656. The examiner can normally be reached on Tuesday, Thursday, or Friday 7:00 to 3:30 (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. James O. Wilson (571) 272-0661, may be contacted. The fax number for Group 1600, Art Unit 1623 is (703) 872-9306.

Visit the U.S. PTO's site on the World Wide Web at <http://www.uspto.gov>. This site contains lots of valuable information including the latest PTO fees, downloadable forms, basic search capabilities and much more.

*Leigh C. Maier*

Leigh C. Maier  
Primary Examiner  
May 27, 2005